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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/725,081	11/29/2000	Atsushi Umeda	PM 275902 54818-US-SUS/nh	7497

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EXAMINER

CUEVAS, PEDRO J

ART UNIT	PAPER NUMBER
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2834

DATE MAILED: 01/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/725,081

Applicant(s)

UMEDA ET AL.

Examiner

Pedro J. Cuevas

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-4, 6 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. The equation " $n \geq 2 p \times m$ " in claim 1 is missing mathematical operators which renders the claim indefinite. The term " $n \geq 2 p \times m$ " is not properly defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. As the examiner understands, the claim language is describing a different equation.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4, 6 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,739,204 to Kitamura et al. in view of U.S. Patent No. 5,965,965 to Umeda et al., further in view of U.S. Patent No. 6,137,201 to Umeda et al.

Kitamura et al. discloses a liquid-cooled vehicle rotary electric machine (Figure 2) operable in a motor mode or a generator mode comprising:

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a frame (26, 30) having an inner periphery, an outer periphery and a liquid passage (32) that is disposed between said inner periphery and outer periphery;

a stator core (10) having an outer periphery fixedly fitted to said inner periphery of said frame, opposite core ends and a plurality of slots;

a multi-phase stator winding (11) accommodated in said plurality of slots; and

a rotor (21) rotatably supported by said frame and disposed inside said stator core so as to electro-magnetically connect said stator core.

However, it fails to disclose a liquid-cooled vehicle rotary electric machine wherein:

said stator winding comprises a plurality of insulated U-shaped conductor segments each of which has a pair of legs each of which is inserted in a slot and connected to another at one of said core ends to form a joint coil end, wherein said liquid passage is disposed near said joint coil end; and wherein:

said rotor has a plurality (P) of magnetic poles alternately disposed at prescribed intervals in the circumferential direction thereof;

said plurality of slots is disposed in said stator to increase contact area of said U-shaped conductor segments with slot inner walls;

the number of said slots is equal or larger than two times as many as the product of the number of said magnetic poles and the number of the phase of said stator; and

a space is defined between adjacent conductor segments at said joint coil end.

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Umeda et al. (5,965,965) teaches the construction of a vehicle rotary electric machine wherein:

a stator winding (8) comprises a plurality of insulated U-shaped conductor segments (33) each of which has a pair of legs (33) each of which is inserted in a slot and connected to another at one of said core ends to form a joint coil end, wherein said liquid passage is disposed near said joint coil end;

said rotor has a plurality (P) of magnetic poles alternately disposed at prescribed intervals in the circumferential direction thereof as stated in lines 34-54 of column 3;

the number of said slots is larger (in this case 96), than two times as many as the product of the number of said magnetic poles and the number of the phase of said stator; and

a space is defined between adjacent conductor segments at said joint coil end, for the purpose of providing an improved structure of coil ends of the stator and rotor which provides high cooling performance with low noise, and does not require the addition of any parts.

Umeda et al. (6,137,201) teaches the construction of a vehicle rotary electric machine wherein:

said plurality of slots are disposed in said stator to increase contact area of said U-shaped conductor segments with slot inner walls and said liquid passage is disposed near said joint coil end.

It would have been obvious to one skilled in the art at the time the invention was made to use the insulated U-shaped conductor segments filled with insulating material, the rotor with 96

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slots, and the stator slot disposition disclosed by Umeda et al. on the liquid-cooled vehicle rotary electric machine disclosed by Kitamura et al. for the purpose of providing an improved structure of coil ends of the stator and rotor which provides high cooling performance with low noise, and does not require the addition of any parts; and providing insulation to the coils.

6. With regards to claim 2, Umeda et al. (6,137,201) discloses the construction of a liquid-cooled rotary electric machine having a space factor more than 55 %, wherein each of said U-shaped conductor segments comprises a flat wire as stated in lines 52 and 53 of column 2, for the purpose of providing an AC generator for vehicles capable of preventing stoppage of the generator due to a short-circuit within a stator slot.

It would have been obvious to one skilled in the art at the time the invention was made to use the liquid-cooled rotary electric machine disclosed by Umeda et al. on the liquid-cooled vehicle rotary electric machine disclosed by Kitamura et al. in view of Umeda et al. for the purpose of providing an AC generator for vehicles capable of preventing stoppage of the generator due to a short-circuit within a stator slot.

7. With regards to claim 3, Kitamura et al. discloses a liquid-cooled vehicle rotary electric machine wherein said stator core and said stator winding are liquid-tightly enclosed by said frame (26, 30) as shown in Figure 2, and stated in line 61 of column 2.

8. With regards to claim 4, Umeda et al. (5,965,965) discloses a liquid-cooled rotary electric machine wherein each of said legs inserted in said plurality of slots is closely fitted to one of said plurality of slot via an insulator (34) for the purpose of providing insulation to the coils.

9. With regards to claim 6, Umeda et al. (5,965,965) discloses a liquid-cooled rotary electric machine wherein said stator winding has a plurality of coil ends (33d) formed of said U-shaped

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conductor segments separated from each other, each of said coil ends is covered by and filled with insulating material (34), and said insulating material is closely fitted to said frame for the purpose of providing insulation to the coils.

10. With regards to claim 8, it would have been obvious to one having ordinary skill in the art at the time the invention was made to space the joint coil end and the frame more than 2 mm, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,739,204 to Kitamura et al. in view of U.S. Patent No. 5,965,965 to Umeda et al., further in view of U.S. Patent No. 6,137,201 to Umeda et al. as applied to claims 1-4 and 6 above, and further in view of Electric Machinery and Transformers, 2nd Ed. to Guru et al.

According to Guru et al. the stator winding current required by any electromechanical device is larger when used as a motor, than the stator winding current supplied by the device when used as a generator, due to the losses of the magnetic circuit.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892.

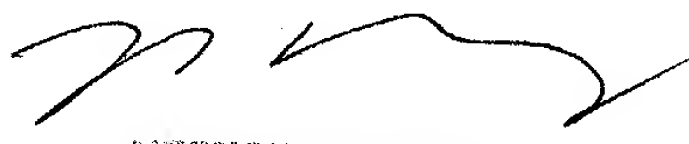
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pedro J. Cuevas whose telephone number is (703) 308-4904. The examiner can normally be reached on M-F from 8:30 - 6:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Néstor R. Ramírez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-1341 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Pedro J. Cuevas
January 17, 2003



NESTOR RAMIREZ
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